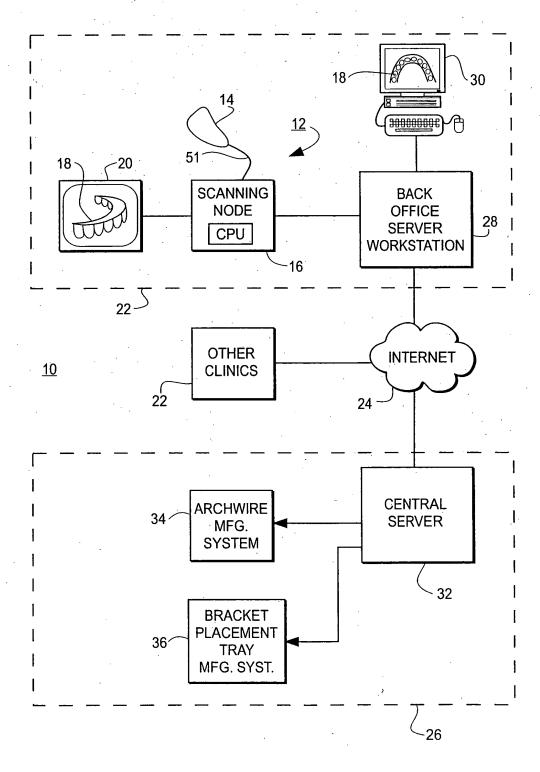


FIG. 1



BEST AVAILABLE COPY



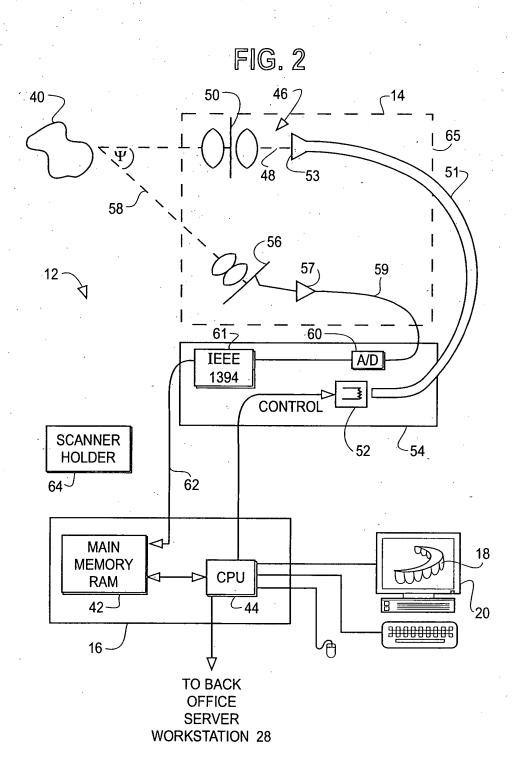




FIG. 3

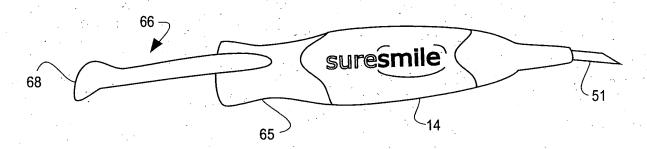
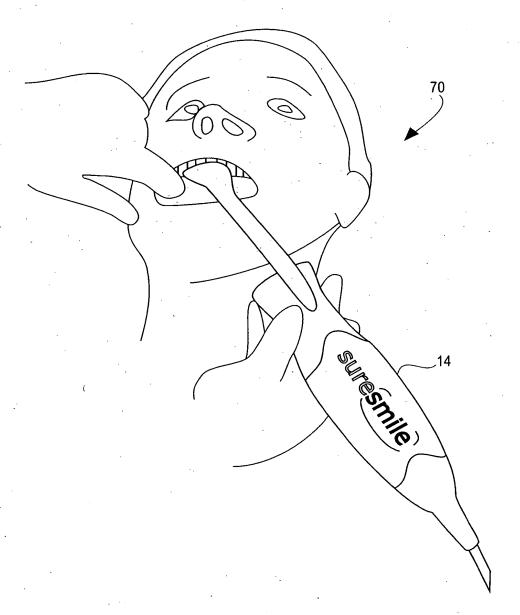


FIG. 4





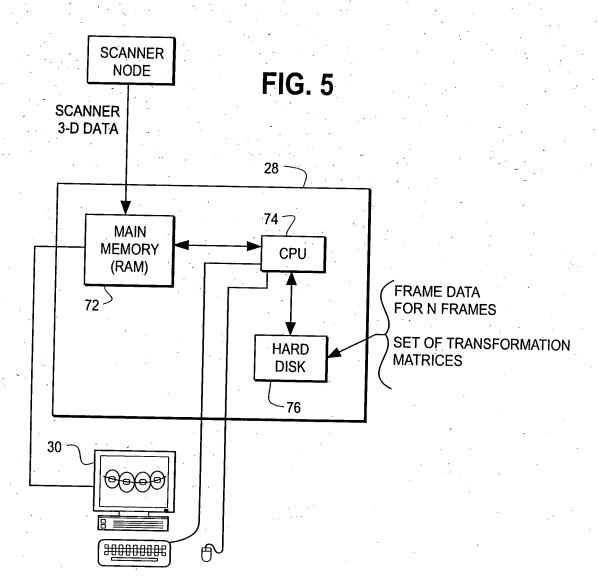




FIG. 6
3- DIMENSIONAL IMAGE CAPTURE (PER FRAME)

PATTERN RECOGNITION PRO CESS

DECODING PROCESS

DERIVATION OF 3-D COORDINATES OF EACH POINT

IN DETECTED PATTERN

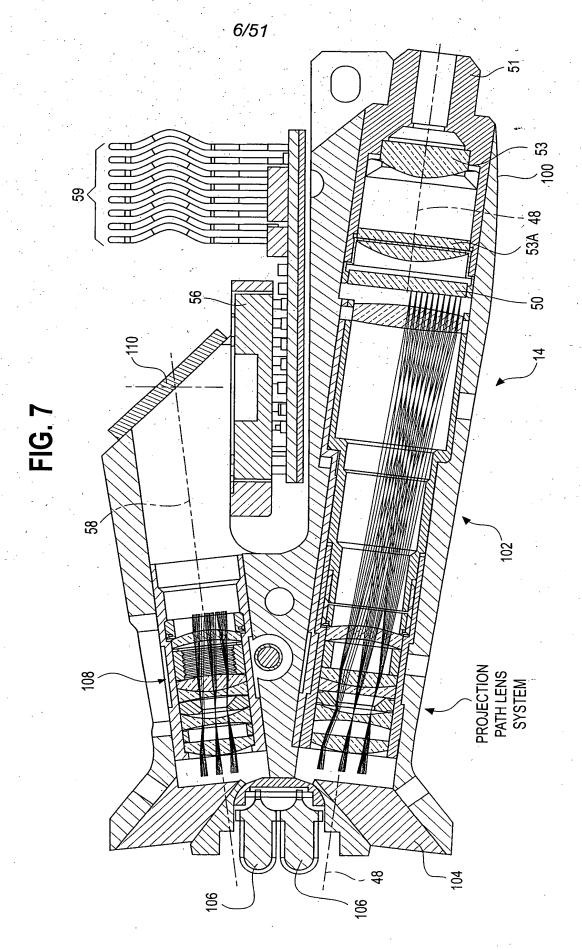
STORE COORDINATES IN HARD DISK

80 -

82

84-

861







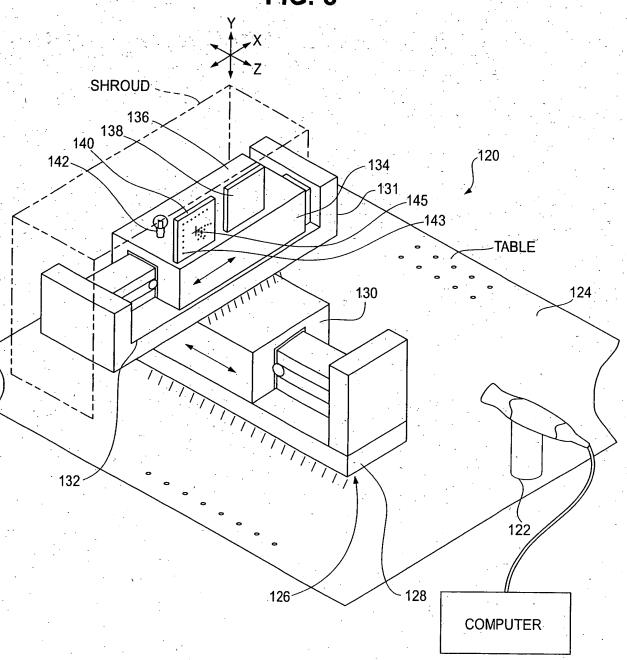




FIG. 8A

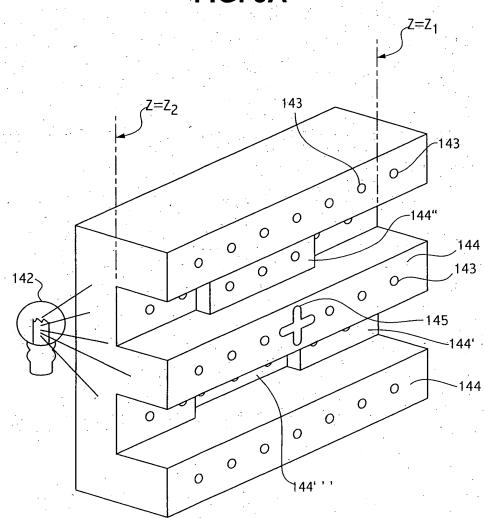




FIG. 9

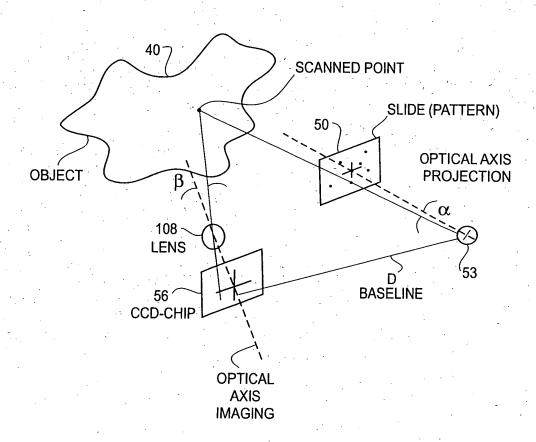
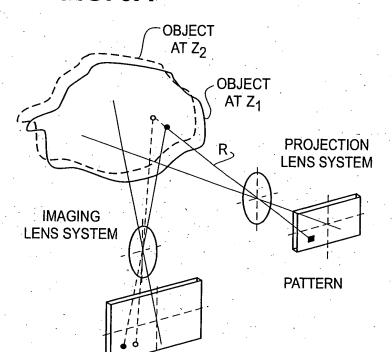




FIG. 9A

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CCD-CHIP

FIG. 9B

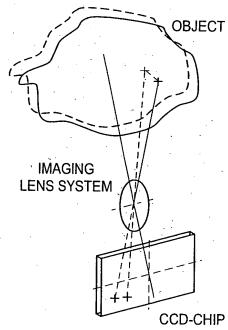
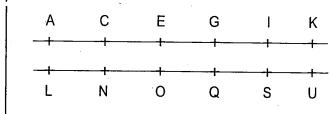
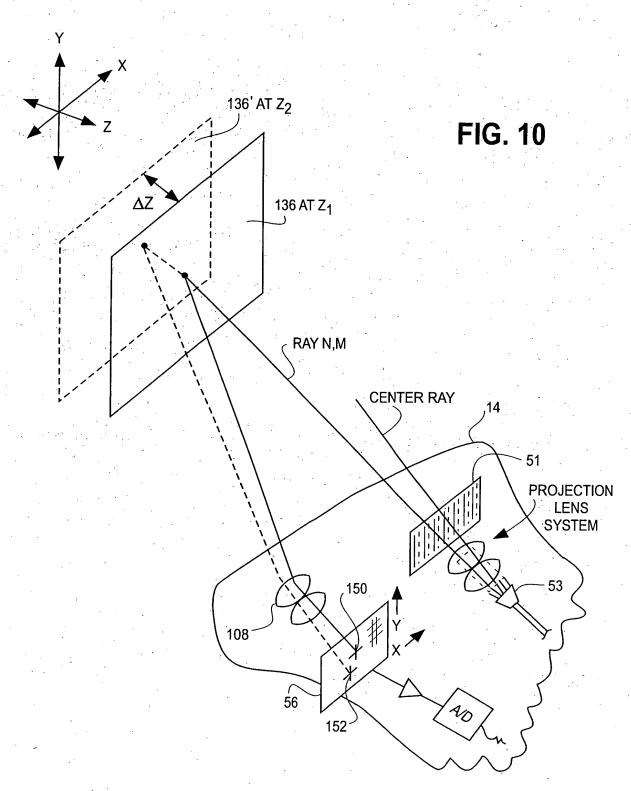


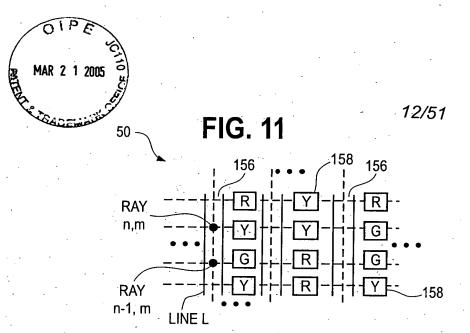
FIG. 9C

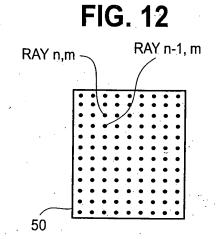


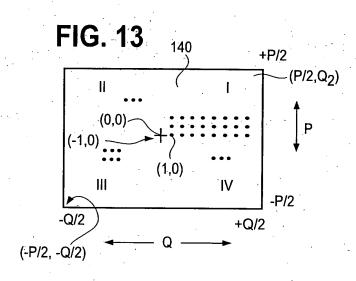
PIXEL COORDINATES FOR PORTIONS OF THE PATTERN ASSIGNED TO A CERTAIN Z-LEVEL











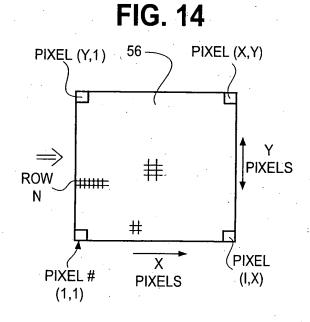


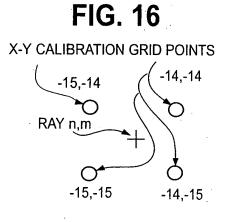
FIG. 15

PIXEL #
Y

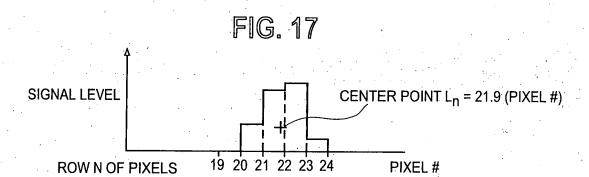
36.20
32.45
31.00

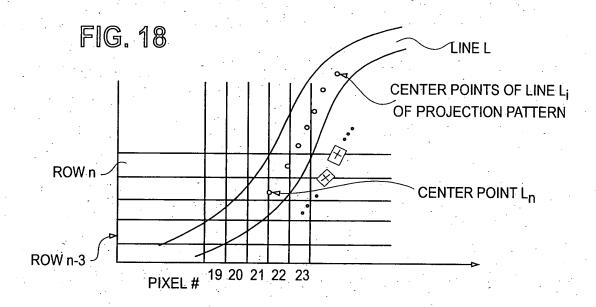
PIXEL #
X

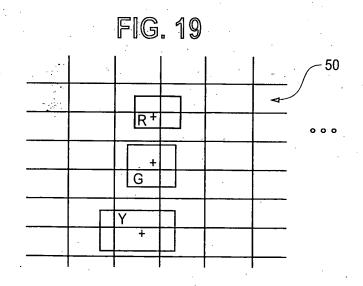
PIXEL #
X















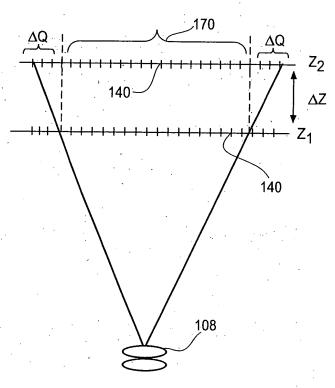
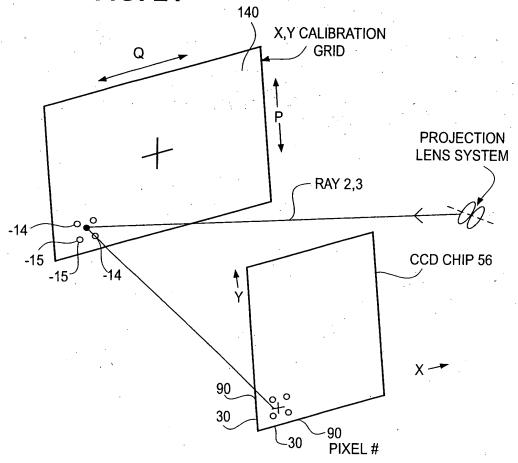


FIG. 21





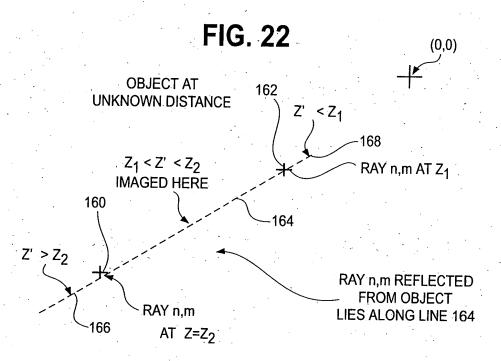
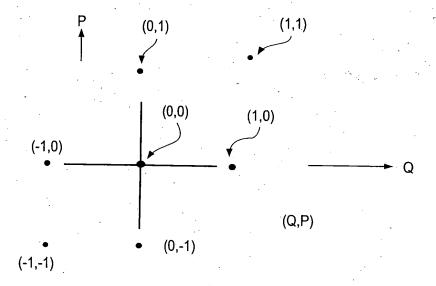


FIG. 23





T. C. 27

 CCD_X , CCD_Y = PIXEL #, IN SUBPIXEL RESOLUTION

CALIBRATION TABLE #1

		Σ		 	1	T	 	<u> </u>	·	1	T			
		ROW M	-											
	LINEN	0 0		. :										
		ROW 2				•	-							
		ROW 1	:								-			
	0 0 0	ROW M												
	0	0 0												
		ROW 4	37.1	. ,	44		46	-	48.2					
	LINE 1	ROW M ROW 1 ROW 2 ROW 3 ROW 4	30.2		36.2		43.0		31.0					
		ROW 2	29.5		21.6		41.1		21.8	. ,				
		ROW 1	27.1		11.5		34.0		13.2					
		ROW M	0 0					·	-					
		0 0				,					,			
Light		ROW 4	2.1		44.5		12.2		46.3					
		ROW 3	1.5		32.8		8.9		30.4					
		ROW 1 ROW 2 ROW 3 ROW 4	-	-	20.4		4.5		21.5					
		ROW 1	1.0		10.2		3.9		12.1	·				
			Xass	MM DIST.	ccD_{γ}	MM DIST.	Xgoo	MM DIST.	Хαээ	MM DIST.				
				7	7		- 27							

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25	3					1			17/5	1							
FIC 25	<u>.</u>	(Q/2, P/2)	1,279.5	1,279.4	1,256.4	1,251.5		(-1, P/2) (-2, P/2) • • • (-0/2, P/2)						~			
. ';		•		·				•	_								
	ROW + P/2	(1, P/2)	•	•	•	•	+P/2	(-2, P/2)	٠.				•				
	ROM	(0, P/2) (1, P/2)	•	•	•	• •. •	ROW +P/2	(-1, P/2)					1 .			-	
(d	- -							•					, 		`		
Ç	<u> </u>	•					:	•					·	٠		1.	
		(2,1)	•	•	•	•		(-3,1)									
3LE #2	ROW 1	1,1)	00.2	701.5	681.2	6.089	_	(-2,1)					QUADRANT III	•	•	≥	
ON TAE		0,1) (640.1 700.2	701.2	<u> </u>	9	ROW 1	(-1,1)	-	•					QUADRANT IV	•	
CALIBRATION TABLE #2		• • • (Q/210) (0,1) (1,1) (2,1)	<u>'</u> 9)/	1,279.5	640.2		• • (-0/210) (-1,1) (-2,1) (-3,1)					QUAD			OUAD	
S		•						•									
								<u>~</u> (0,0		·							
	ROW 0	(Q/2 - AQ,0)	•	•	•		ROW	(-Q/2 - AQ,0)									
		• • •	•				~	•									
~		(3,0)	820.5	640.4	801.6	640.1		(4,0)			-				•		
		(2,0) (3,0)	9.092	640.3	741.2	640.1 640.1		(-3,0)					2,-1)			1,-1)	
	I L	(1,0)	700.2	640.1	680.3	640.3		(-1,0) (-2,0) (-3,0) (-4,0)					Z ₁ CCD _X (-1,-1) (-2,-1)			(0,-1) (1	
	QUADRANT	(0,0) (1,0)	340.1	340.1		340.2	=	-1,0).					× (-)	ا ا کاک	╵╵ ╲╭	© ×;	
	Ø		CCD _X 640.1 700.2	ССD _Y 640.1	CCD _X 640.2	CCDy 640.2 640.3	QUADRANT II	$\stackrel{\smile}{}$	CCDX	ССБү	XQQQ	λgoo	z ₁ cci	CCDY	75 ccDy	Z ₁ CCD _X	Z ₂ CCD _X CCD _Y
			7	ı		75	QUAI		, ,	ı		-57 C		ı		'	1. 7

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_	COADE	:	(

 CCD_X , $CCD_Y = PIXEL \#$, IN SUBPIXEL RESOLUTION

CALIBRATION TABLE #1

	ROW					-				
. Z	0									:
Z Ц 2	8						-			
: 	ROW 1						_			
	ROW M									
	6									
<u>.</u>	ROW 4	37.1		44		46		48.2		
	ROW 3	30.2	-14.6	36.2	-14.4	43.0	-14.8	31.0	-15.8	
	ROW 2	29.5		21.6		41.1		21.8		
LINE 2	ROW 1	27.1		11.5		34.0		13.2		
PATTERN 	ROW M	0 0								
	0 0	-								
	ROW 4	2.1		44.5		12.2		46.3		
LINE 1	ROW 3 ROW	1.5		32.8		6.8	·	30.4		
	ROW 1 ROW 2	<u>-</u>		20.4	-	4.5		21.5		
PATTERN	ROW 1	1.0		10.2		3.9		12.1		
٠.		CCDX	MM DIST.		MM DIST.	ХССО	MM DIST.	ССБү	MM DIST.	<u>-</u>

7

75



19/51 Fig. 27

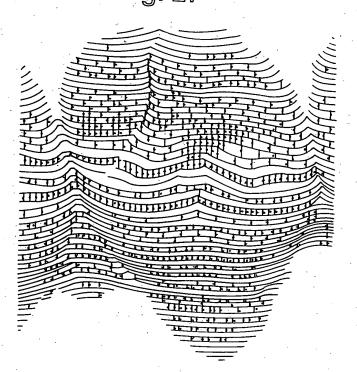
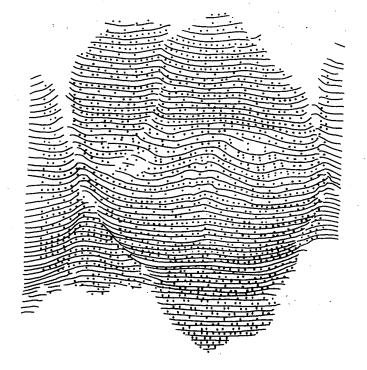


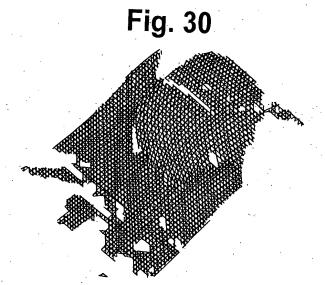
Fig. 28





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Fig. 29



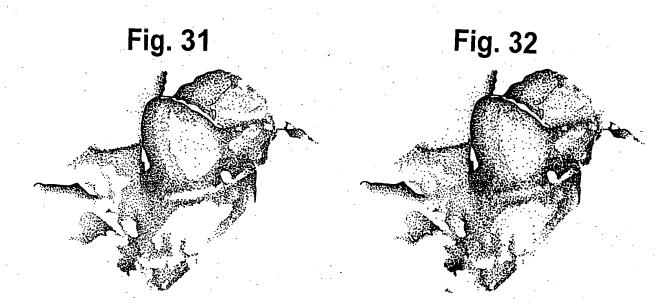




Fig. 33



Fig. 34

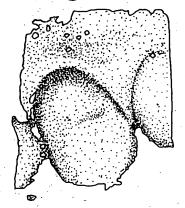


Fig. 35

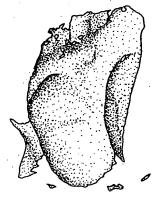
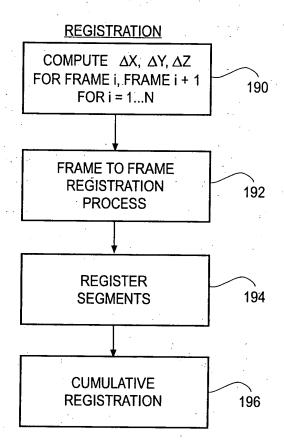
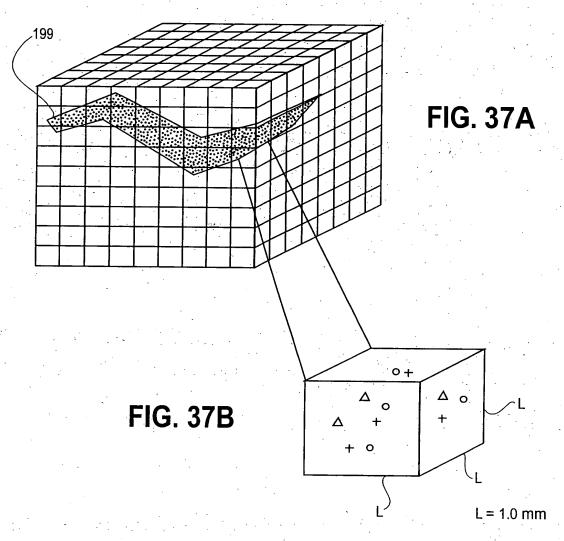




FIG. 36







 Δ = POINTS OF FRAME i

+ = POINTS OF FRAME i + 1

• = POINTS OF FRAME i + 2



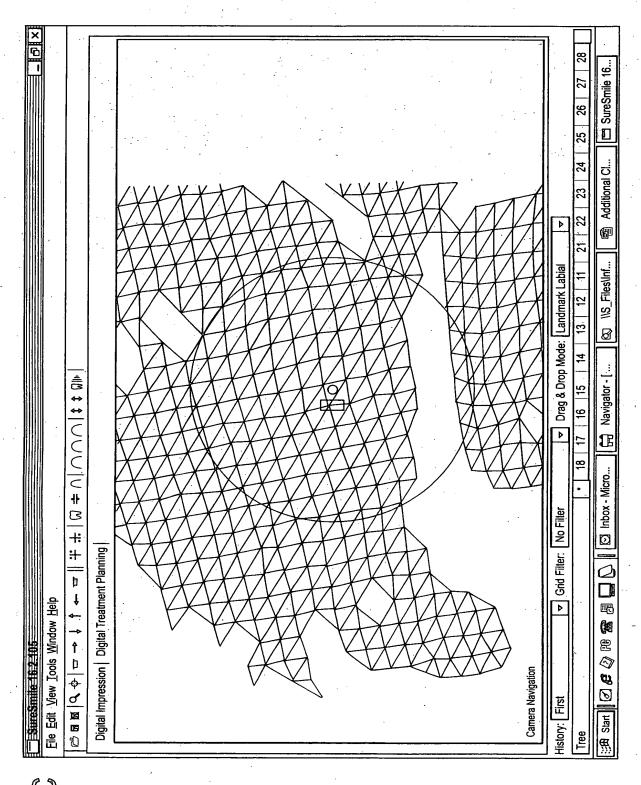


FIG. 37C



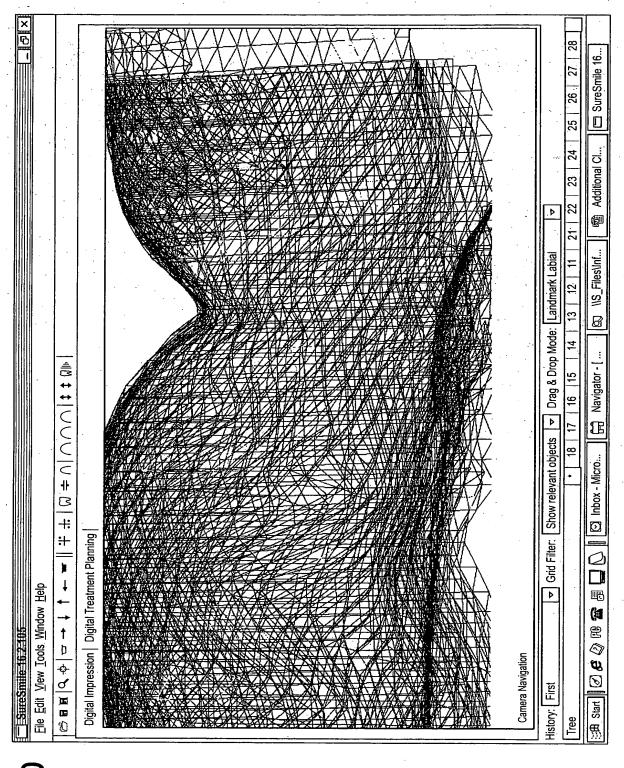


FIG. 37D

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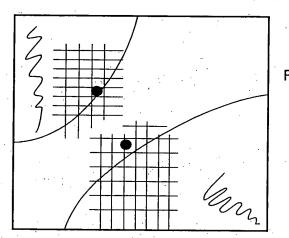
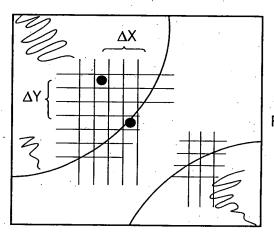
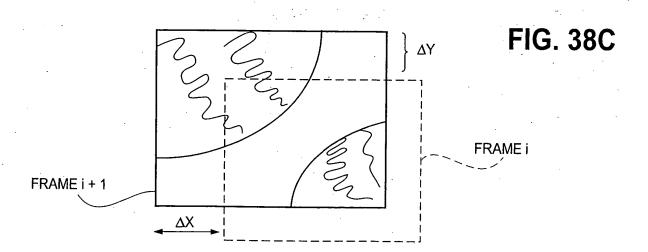


FIG. 38A

FRAME i

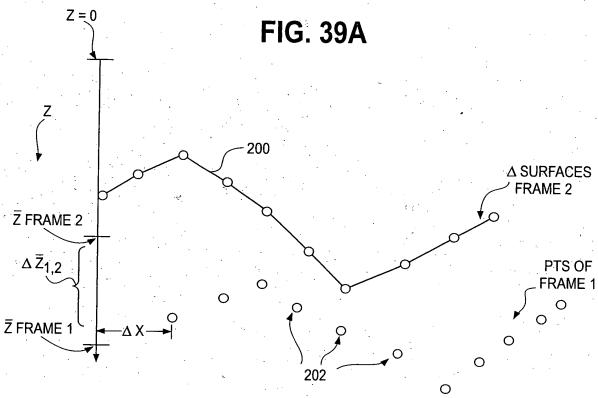
FIG. 38B





FRAME i + 1

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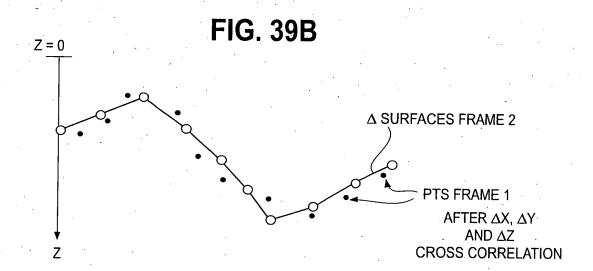




FIG. 40A

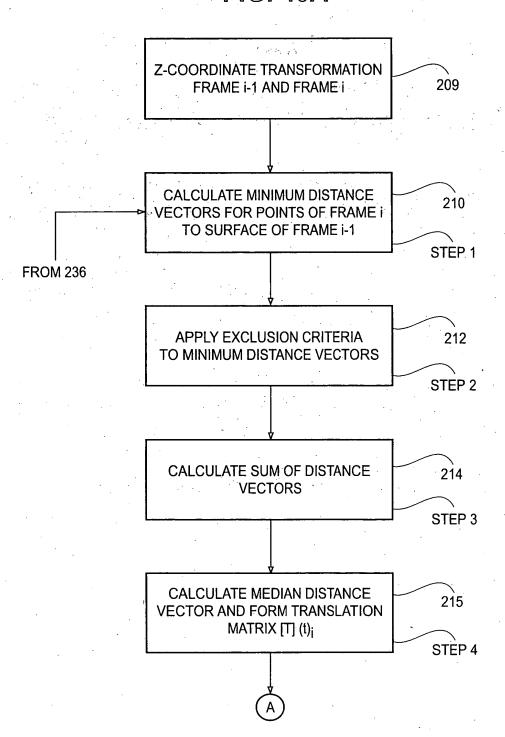




FIG. 40B

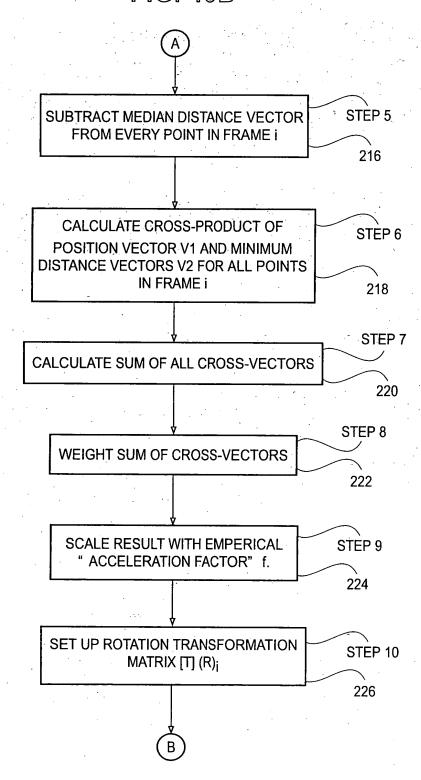




FIG. 40C

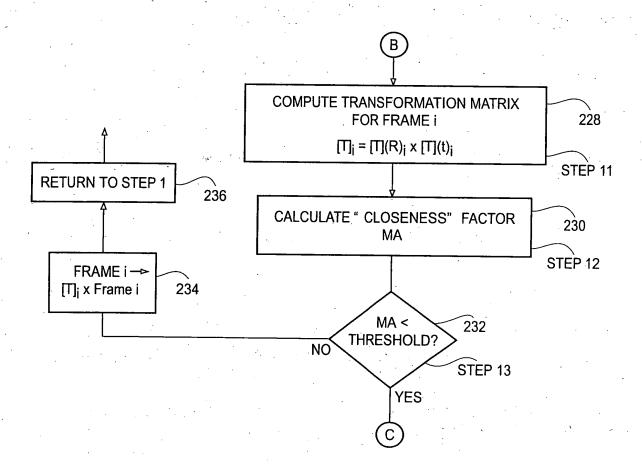
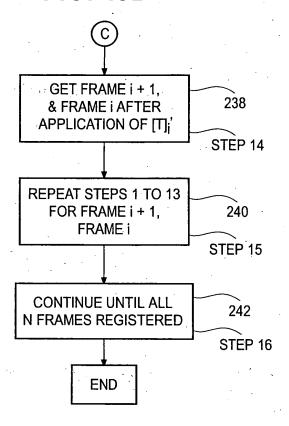
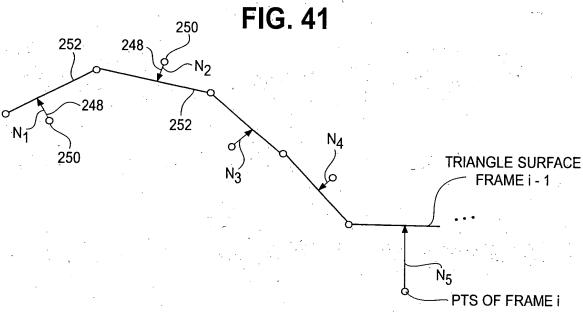




FIG. 40D



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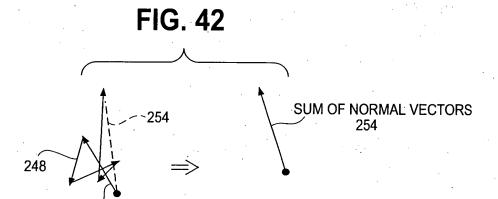


FIG. 43

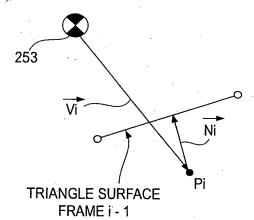
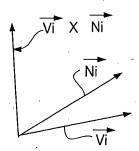


FIG. 44





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FIG. 45

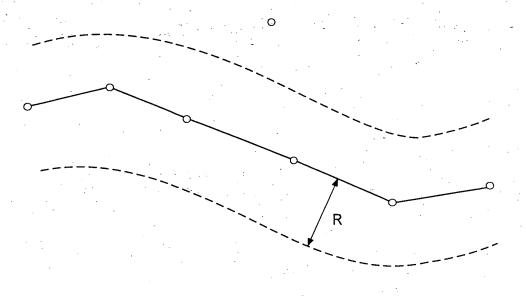
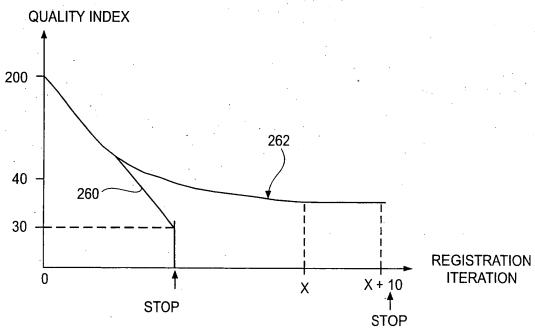


FIG. 46





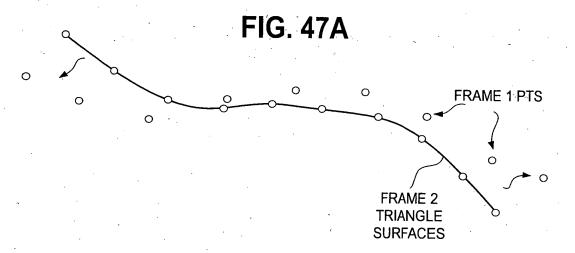


FIG. 47B

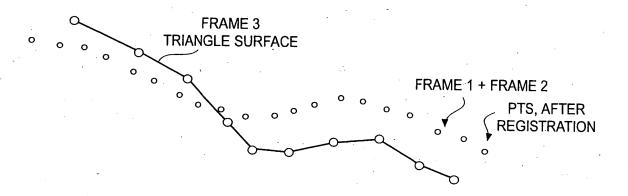




FIG. 48A

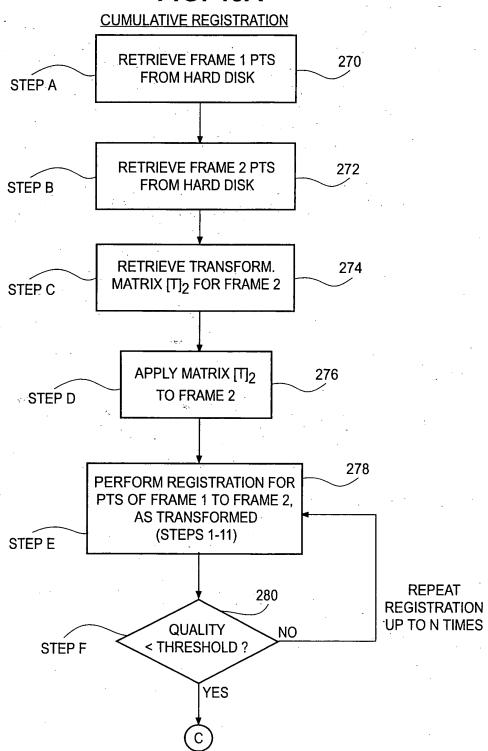




FIG. 48B

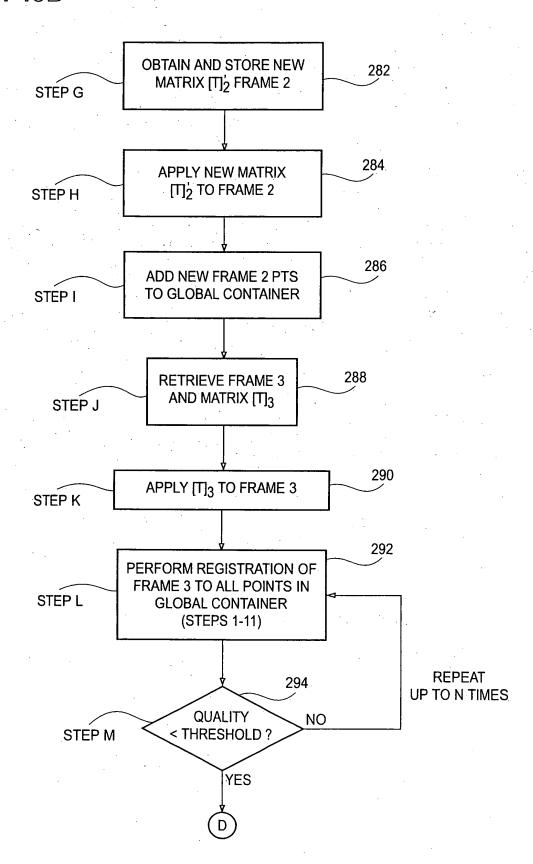
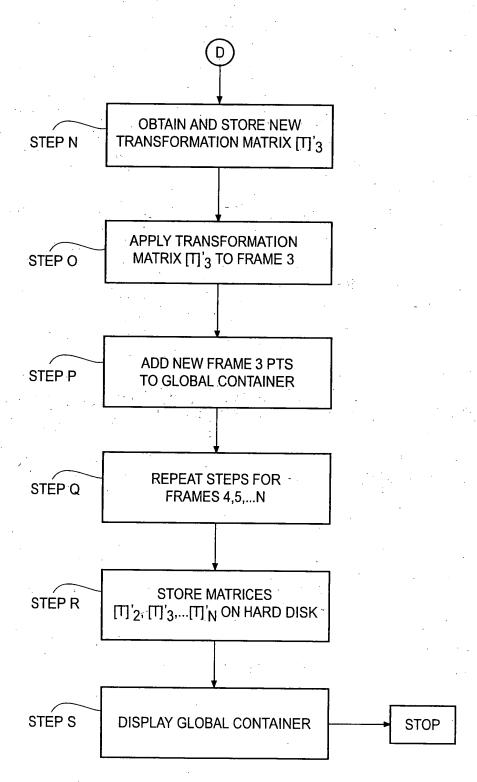




FIG. 48C



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FIG. 49

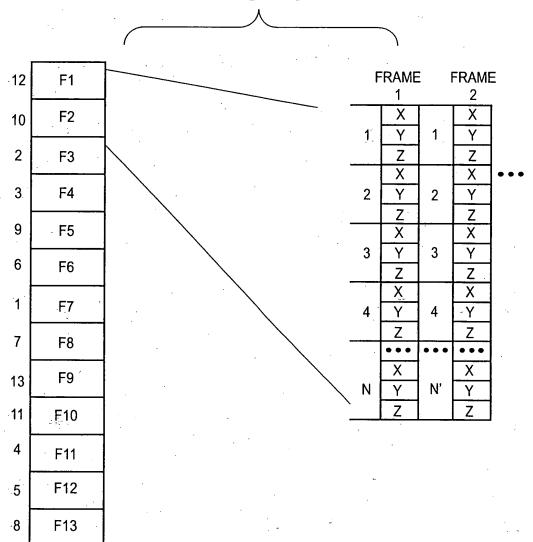


FIG. 50

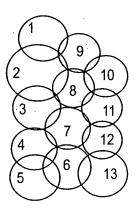




FIG. 51

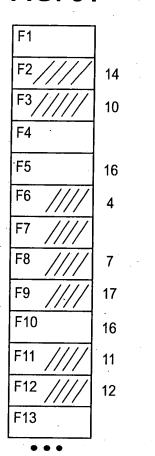


FIG. 52

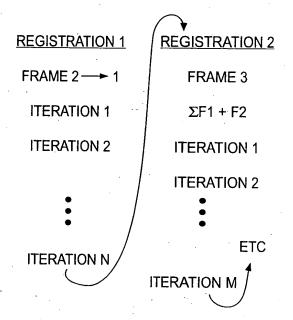
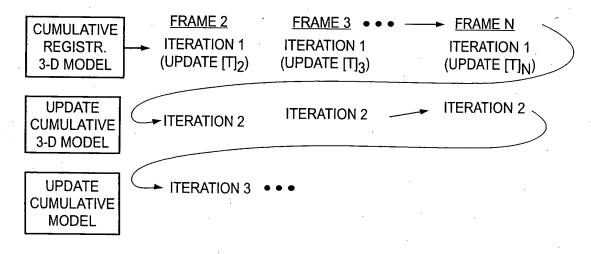


FIG. 53



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Distance limit 250.00y (SYX)
Stationary
count Radius (SYX) 2.000mm
factor
Number of points to register
Accelerate factor
r general
Count of SYX surfaces for animation (0= off)
- Merging
Radius of sphere inside 0.500mm which is to replace
Maximal count of edge lines for closing gaps

FIG. 54



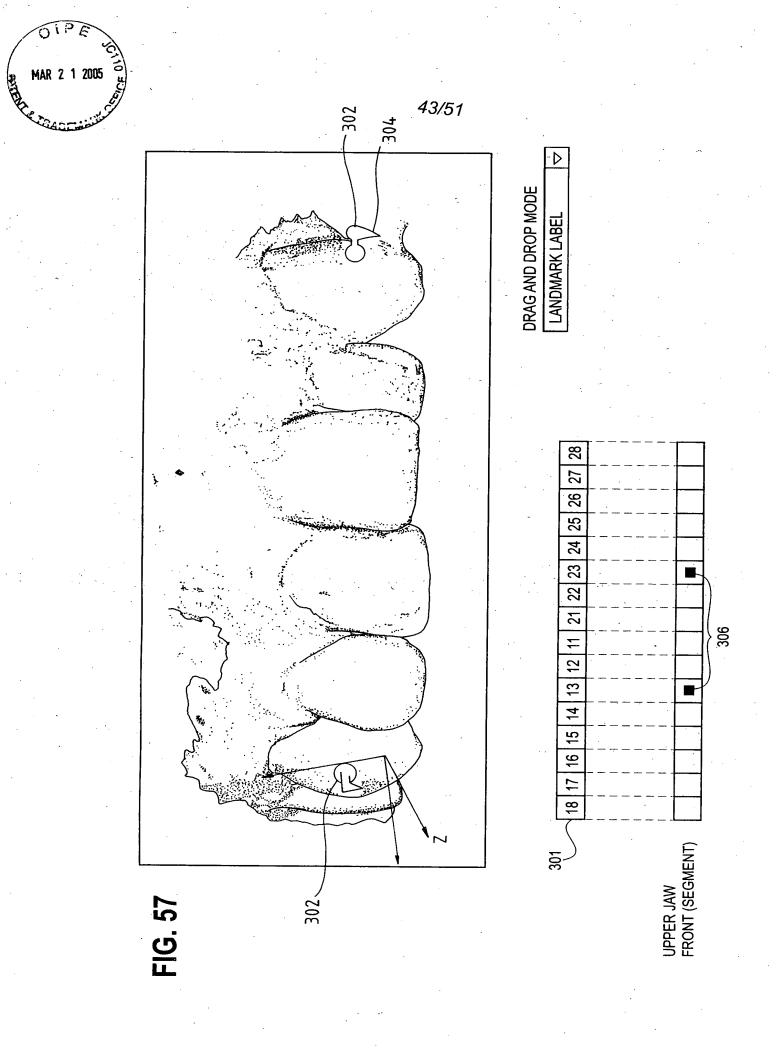
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FIG. 55



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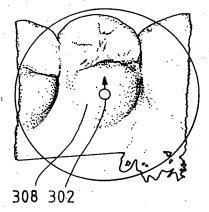
FIG. 56





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Fig. 58A



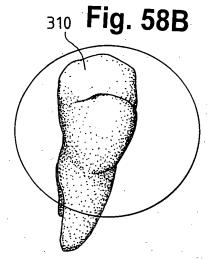
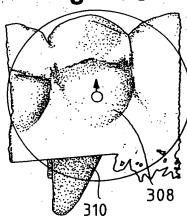
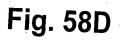


Fig. 58C





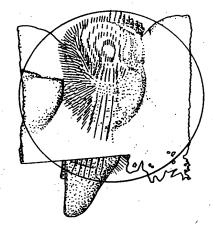


Fig. 58E

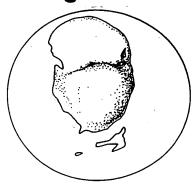
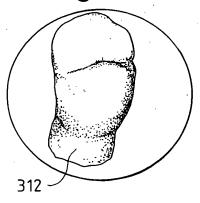
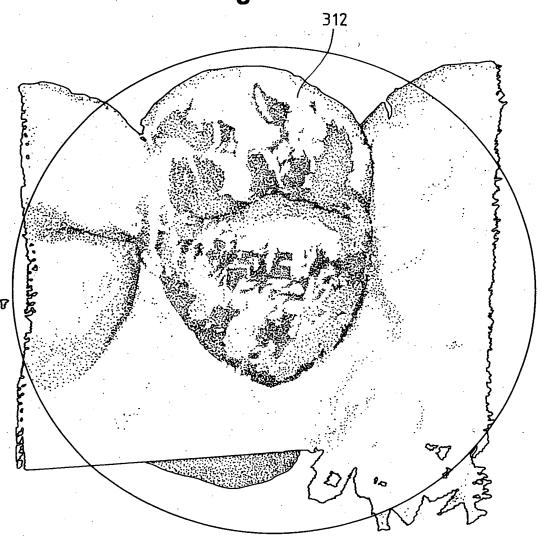


Fig. 58F

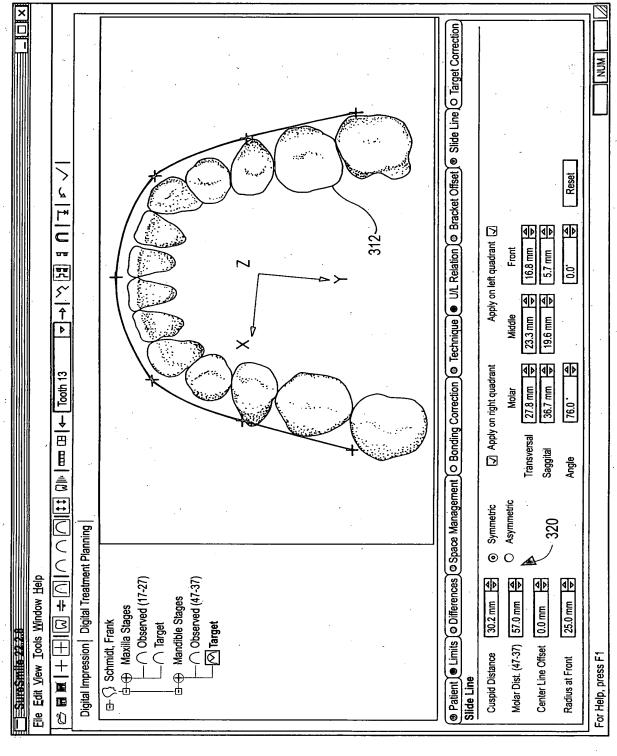












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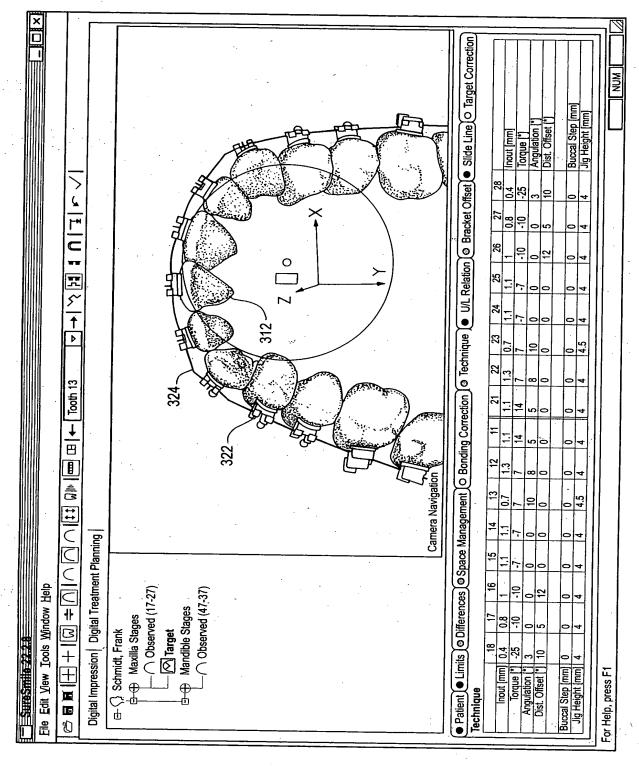


FIG. 67



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FIG. 62



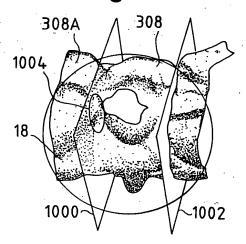
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FIG. 63





Fig. 64A



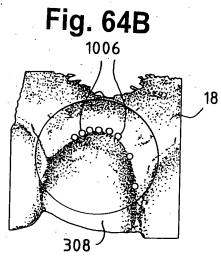


Fig. 64C

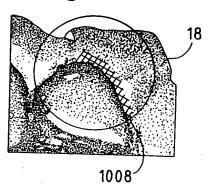


Fig. 64D

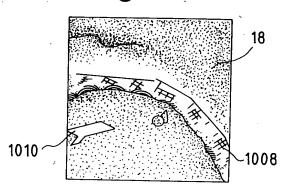
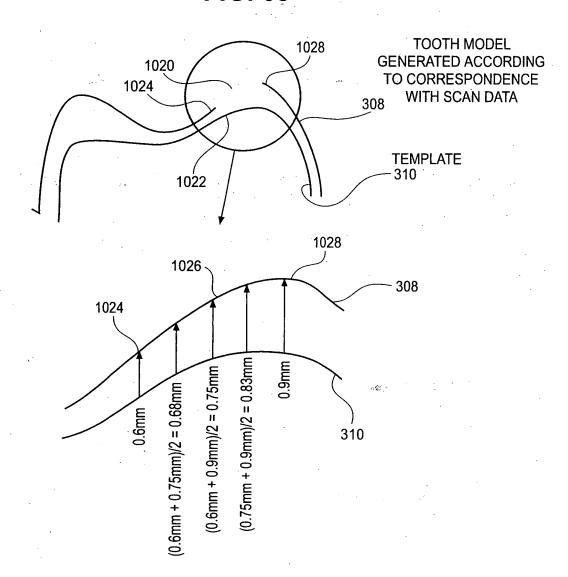




FIG. 65



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